

CLAIMS

1. A plant for the production of logs of web material, comprising in combination at least:

- 5 – one winder (3) which receives at least one web material and produces large diameter reels (B) by winding said web material around winding mandrels (M);
- at least one unwinder (9) which unwinds said large diameter reels (B) and feeds the web material to a converting line (15, 21, 23);
- 10 – a plurality of carriages (11) which transfer said reels from a loading station (7) to said unwinder (9), sustain said reels in the unwinder during unwinding and convey the finished mandrels back to a recovery area.

2. Plant as claimed in claim 1, furthermore comprising means for transfer (5) of the reels from the winder (3) to said carriages.

15 3. Plant as claimed in claim 2, in which said transfer means comprise a conveyor (5) running between said winder (3) and said loading station (7).

4. Plant as claimed in claim 3, in which said conveyor comprises a conveying guide (5) for said reels.

5. Plant as claimed in claim 4, in which said conveying guide supports the reels via the protruding ends (M1) of the winding mandrels (M).

20 6. Plant as claimed in claim 3, 4 or 5, in which said conveyor (5) comprises moving parts (5A) which assume a retracted position for inlet and outlet of the carriages to and from said loading station, and an active position in which they permit transfer of the reels to a carriage positioned in the loading station.

25 7. Plant as claimed in one or more of the preceding claims, comprising a continuous paper machine (1) for the production of said web material, which consists of at least one ply of paper, in particular tissue paper.

8. Plant as claimed in one or more of the preceding claims, in which said unwinder comprises two stations for two of said carriages (11).

30 9. Plant as claimed in claim 8, in which between the loading station (7) and the unwinder (3) means are provided which can rotate said carriages 180° around a vertical axis before inserting them in the unwinder, the two carriages (11E, 11F) simultaneously present in the unwinder being rotated

180° with respect to each other.

10. Plant as claimed in one or more of the preceding claims, comprising a parking area (13) for reels produced by said winder, when said unwinder is not able to receive said reels.

5 11. Plant as claimed in one or more of the preceding claims, in which said carriages comprise a device for locking the mandrels on which said reels are wound.

12. Plant as claimed in claim 11, in which said locking device is combined with a rolling track (31A) on which said mandrels roll, the locking
10 device retaining the mandrels in a given position along said rolling track.

13. Plant as claimed in claim 12, in which said rolling track is slanting with respect to the horizontal, to permit rolling by gravity of the mandrels along the track.

14. Plant as claimed in claims 3 and 13, in which said rolling track
15 is arranged to constitute an extension of the conveying guide (5) of the reels in the loading station.

15. Plant as claimed in one or more of the claims 11 to 14, in which said device comprises, for each end of the mandrels, a lever mechanism defining a seat (43) for housing and retaining the corresponding end of the
20 mandrel, and an actuator to lock and release the mandrels by means of said lever mechanism.

16. Plant as claimed in claim 15, in which said lever mechanism comprises a member (41) defining said seat (43), sustained by an oscillating lever (35) and a pair of levers hinged together (47, 49).

25 17. Plant as claimed in claim 16, in which said pair of hinged levers is combined with an actuator (51) which causes opening and closing of the pair of levers, said opening and closing causing oscillation of said oscillating lever and an oscillation and/or translation movement of the member defining the seat (43) for housing and retaining the end of the mandrel, to perform the
30 functions of receiving the reels, lifting the reels from the rolling track and lowering the seat (43) below the rolling track to permit unloading of the finished mandrels.

18. Plant as claimed in claim 17, in which said actuator is a cylinder-piston actuator.

19. Plant as claimed in claim 18, in which said actuator comprises a twin cylinder-piston system (51A, 51B).

20. Plant as claimed in one or more of the claims 17 to 19, in which said oscillating lever (35) is combined with a shock absorber (39).

5 21. Plant as claimed in claim 20, in which an elastic member parallel to said shock absorber is combined with it.

22. Plant as claimed in one or more of the claims 16 to 21, in which said oscillating lever (35) and said pair of hinged levers (47, 49) are arranged so that the impact of a mandrel against said seat causes raising of the member defining the seat.
10

23. Plant as claimed in one or more of the preceding claims, in which said carriages comprise motorized members to rotate the mandrels and angularly position the reels arranged on them.

24. Plant as claimed in one or more of the preceding claims, in which a guide (26) is provided in said loading station for unloading the finished mandrels from the carriages (11).
15

25. Plant as claimed in claim 24, in which said guide (26) for unloading the mandrels comprises movable portions (26A) which assume a retracted position for inlet and outlet of the carriages to and from said loading station, and an active position in which they permit passage of the mandrels from the carriage to the unloading guide.
20

26. Plant as claimed in one or more of the preceding claims, in which said carriages are self-moving and remote-controlled.

27. A carriage for supporting reels of web material wound on mandrels, comprising a rolling track (31A) of said mandrels and a device for locking said mandrels, to retain the mandrels with the reels formed on them in a position along said rolling track.
25

28. Carriage as claimed in claim 27, in which said rolling track is slanting with respect to the horizontal, to permit rolling by gravity of the mandrels (M) along the track (31A).
30

29. Carriage as claimed in claim 27 or 28, in which said device comprises, for each end of the mandrels, a lever mechanism defining a seat (43) for housing and retaining the corresponding end of the mandrel, and an actuator to lock and release the mandrels via said lever mechanism.

30. Carriage as claimed in claim 29, in which said lever mechanism comprises a member (41) defining said seat (43), supported by an oscillating lever (35) and a pair of levers (47, 49) hinged together at one end, one of said levers being hinged to the carriage and the other being hinged to said member (41) defining said seat(43).

31. Carriage as claimed in claim 30, in which said pair of hinged levers is combined with an actuator (51) which causes opening and closing of the pair of levers, said opening and closing causing an oscillation of said oscillating lever and oscillation and/or translation movement of the member defining the seat (43) housing and retaining the end of the mandrel, to perform the functions of receiving the reels, raising the reels from the rolling track and lowering the seat (43) below the rolling track to permit unloading of the finished mandrels.

32. Carriage as claimed in claim 31, in which said actuator is connected to the two levers at the axis (W) where they are hinged together.

33. Carriage as claimed in claim 31 or 32, in which said actuator is a cylinder-piston actuator.

34. Carriage as claimed in claim 33, in which said actuator comprises a twin cylinder-piston system (51A, 51B).

35. Carriage as claimed in claim 33 or 34, in which said actuator is a hydraulic actuator.

36. Carriage as claimed in one or more of the claims 31 to 36, in which said oscillating lever (35) is combined with a shock absorber (39).

37. Carriage as claimed in claim 36, in which an elastic member is combined in parallel with said shock absorber.

38. Carriage as claimed in one or more of the claims 30 to 37, in which said oscillating lever (35) and said pair of hinged levers are arranged so that the impact of a mandrel against said seat causes raising of the member defining the seat.

39. Carriage as claimed in one or more of the claims 27 to 38, comprising motorized members to rotate the mandrels and position at an angle the reels arranged on them.

40. Carriage as claimed in one or more of the claims 27 to 39, self-moving and remote-controlled.

41. Method for producing reels of web material and transforming said reels into finished products, comprising the following phases:

- winding said web material around winding mandrels (M) and forming said reels;
- 5 - loading the reels (B) on respective movement carriages (11);
- transferring the reels by means of said carriages to an unwinder;
- supporting the reels by means of said carriages during unwinding;
- transferring via said carriages the finished mandrels from the unwinders to a mandrel recovery area.